

## Abstract

An equalizer for use in a communication receiver includes an infinite impulse response (IIR) feedback filter operated in acquisition and tracking feedback modes on a sample by sample basis to form a hybrid Decision Feedback Equalizer (DFE) architecture. In acquisition mode, soft decision samples from the filtered received signal are input to the IIR filter. In the tracking mode, hard decision samples from a slicer are input to the IIR filter. Acquisition and tracking operating modes are selected in accordance with a set of decision rules on a sample by sample basis based on the quality of the current hard decision. If the current hard decision is low quality, then the soft decision sample (acquisition mode) is used. If the current hard decision is high quality, then the hard decision sample (tracking mode) is used. In such manner, the DFE is operated in a hybrid mode, i.e., using both soft and hard decisions on a sample by sample basis. Furthermore, the decision rules that are responsive to signal reliability to select acquisition and tracking modes are adaptive.

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